

Remarks/Arguments

Claim Rejections - 35 USC §112

Claims 21 to 23 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. The claims have therefore been amended to overcome these objections. Antecedents have been included for all elements where relevant. In the case of the definition of the constants, the various letters are now defined as representing numerical values which are constant for the non-circular surface portions. What is being claimed for purposes of the constants would seem to be quite clear. The actual values of these constants are not necessary to satisfy §112, second paragraph. The person of skill in the art would understand that he is being told that they are of a constant value and that is all he or she needs to know at this point for the purposes of the invention as defined in these claims.

Claim Rejections - 35 USC §102

The Examiner rejected claims 1, 11 and 14 under 35 U.S.C. §102(b) as being anticipated by Hintsch (US patent no. 4,230,210). On the other hand, the Examiner did indicate that claims 2 to 10, 12, 13 and 15 to 18 would be allowed if rewritten in independent form including all the limitations of the basic claim and any intervening claims. Applicants are grateful for this indication by the Examiner.

Claim 1

In the currently presented amended claims, claim 1 has been amended with all the features of claim 6. Given the Examiner's indication that the subject matter of claim 6 constituted allowable subject matter; amended claim 1 is now allowable.

New Claims

Applicants are adding a number of new independent claims, all of which contain all the features of previously examined claim 1.

New Claim 27

New independent claim 27 is the same as original claim 1 but with the added feature that the first rotatable body is rotatable relative to the second rotatable body. This claim includes the further limitation that, as the first and second rotatable bodies rotate each other through the first and second non-circular surface portions, an amount by which the first body rotates varies relative to an amount through which the second body rotates.

In Hintsch the two cam bodies 3, 4 are mounted on a same shaft 1, at a fixed angle relative to each other, to rotate in unison (see column 2, lines 66-68). The features of claim 27 are thus distinguished from the teaching of Hintsch by the fact that, in claim 27 the bodies can rotate relative to each other. Moreover, in claim 27, it is not simply a matter of rotation through the same angles or consistently through directly proportional angles, the amount through which one rotatable body rotates relative to the other varies as the two bodies rotate relative to each other through the first and second non-circular surface portions. This non-direct or disproportionate rotation would not be applicable to Hintsch as the whole mechanism is based upon the two cams rotating in unison.

New Claim 28

New claim 28 corresponds to original claim 1, but with the feature of the first and second rotatable bodies being arranged to rotate each other through the first and second non-circular surface portions being further defined. More particularly, according to claim 28 the first rotatable body is arranged to rotate the second rotatable body through the first and second non-circular surface portions and the second rotatable body is arranged to rotate the first rotatable body through the second and first non-circular surface portions.

In Hintsch rotation of the second cam is directly as a result of rotation of the first cam and vice versa. Rotation of the first cam, caused by force on the first non-circular surface portion will lead to rotation of the second body, but only through the joint shaft 1, and in no way through the second non-circular surface portion. Likewise rotation of the second cam can be achieved through a force applied to the second non-circular surface portion but this leads to direct rotation of the first cam through the shaft 1, and does not in any way pass through to the first cam through the first non-circular surface portion. The mechanism of claim 28 is therefore completely distinct from that taught in Hintsch.

With the mechanism of claim 28, the first and second non-circular surface portions are, in effect, in between the two rotatable bodies, whilst in Hintsch, the non-circular surfaces are the external surfaces of the two bodies. Hintsch would not operate as intended and could not be modified to include these features without other modifications and neither these features themselves nor the other modifications are taught or otherwise obvious.

New Claim 29

New claim 29 is based upon original claim 1, with the added limitation that the first and second rotatable bodies are arranged to rotate between two extreme positions, between which two extreme positions the direction in which the first spring biases the second rotatable body to rotate is unchanging. This feature is readily derivable from any of the embodiments. It can be seen that the arms can either rotate through a limited amount or at least 360°. Where the limitation is limited, the two stop positions are the extreme positions. Where the arm can rotate through at least 360°, any point on the rotation and the same point after a 360° rotation can be viewed as the two extreme positions. Throughout the rotation (in either case), the direction in which the spring biases the second rotatable body does not change. It is clockwise in the embodiments of Figures 3 to 5 and for one of the cam pairs in Figure 6 and anti-clockwise for the other of the cam pairs in Figure 6.

On the other hand, in Hintsch the direction in which the spring 19 biases the cam 3 to rotate depends upon the relative positions of the cam 3 and the roller 6. When the roller 6 is on one side of each recess 71 or projection 66, the direction will be clockwise and when the roller 6 is on the other side of each recess 71 or projection 66, the direction will be anti-clockwise.

New claim 31

New claim 31 is also derived from original claim 1; with features from claim 6, but without the first rotatable member. Thus the first and second non-circular surface portions have sizes and shapes and the first spring has a property which are selected for use with a first rotatable member which generates a predetermined first torque profile as the first rotatable member rotates. Further, the first spring causes the first rotatable body to generate a second torque profile to apply to the first rotatable member as the first rotatable body rotates, and the second torque profile corresponds to the predetermine first top profile. Thus, although the first rotatable member is not claimed as a component of this mechanism, the first and second rotatable bodies and the spring are intended for use with a predetermined first torque profile, such that a second torque profile generated by the first rotatable body due to the spring corresponds to the predetermined first torque profile. This is what is used for gravity compensation as provided by the present invention.

The cam 3 in Hintsch is centrally mounted, rather than eccentrically. For most of its contact with the surface of the cam 3, the spring 19 provides no torque whatsoever to the cam 4. There is certainly no suggestion of this torque corresponding to the torque being applied to the cam 4 by the arm 72. Indeed, given the respective shapes of the two cams 3, 4, it is quite clear that the two torque profiles, such as they might be, would be very different and by no means corresponding.

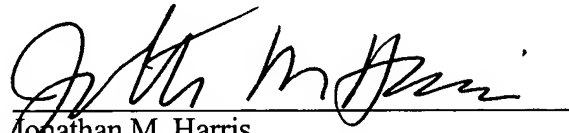
Appl. No.: 10/631,135
Amdt. dated August 4, 2004
Reply to Office action of May 24, 2004

Conclusion

Given the various differences between the claimed inventions and the prior art, Applicants respectfully ask that the Examiner allow all the present claims and issue a notice of allowance in due course.

If any fees or time extensions are inadvertently omitted or if any fees have been overpaid, please appropriately charge or credit those fees to Conley Rose Deposit Account Number 03-2769 and enter any time extension(s) necessary to prevent this case from being abandoned.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Jonathan M. Harris', is written over a horizontal line.

Jonathan M. Harris
PTO Reg. No. 44,144
CONLEY ROSE, P.C.
(713) 238-8000 (Phone)
(713) 238-8008 (Fax)
ATTORNEY FOR APPLICANTS